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PLANNING BOARD
GRAFTON, MA

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October 26, 2015

Joseph Laydon
Town Planner
Grafton Municipal Center
30 Providence Road
Grafton, MA 01519

Subject: **Proposed Site Development, CEC Solar #1056 LLC**
207 Providence Road
Special Permit and Site Plan Review

Dear Joe:

We received the following documents on October 23, 2015 via e-mail and on October 26, 2015 in hard-copy format:

- Correspondence from Field Engineering Co. Inc. to the Grafton Town Planner dated October 23, 2015, regarding "Proposed Site Development, CEC Solar #1056 LLC, 207 Providence Road Special Permit and Site Plan Review, Response Comment Second Graves Engineering Letter."

- Plans entitled Proposed Site Development, CEC Solar #1056 LLC, 207 Providence Road, Grafton, Massachusetts dated August 12, 2015 and last revised October 22, 2015, prepared by Field Engineering Co, Inc. for CEC Solar #1056 LLC. (13 sheets)

- Document entitled Stormwater Management System Report, Addendum 2, CEC Solar #1056 LLC, Proposed Solar Panel Array Installation, 207 Providence Road, Grafton, Massachusetts dated October 22, 2015, prepared by Field Engineering Co, Inc. for Clean Energy Collective, LLC.

Graves Engineering, Inc. (GEI) has been requested to review and comment on the plans' conformance with applicable "Grafton Zoning By-Law" amended through October 14, 2013; Massachusetts Department of Environmental Protection (MADEP) Stormwater Management Policy and standard engineering practices on behalf of the Planning Board. GEI has also been requested to review and comment on the documents' conformance with applicable Conservation Commission "Regulations Governing Stormwater Management" dated May 2013 on behalf of the Conservation Commission.

This letter is a follow-up to our previous review letters dated September 10, 2015 and October 21, 2015. For clarity, comments from our previous letters are *italicized* and our latest comments to the Applicant's responses are depicted in **bold**. For brevity, comments previously addressed by the design engineer and acknowledged by GEI have been omitted. Previous comment numbering has been maintained.

Our comments follow:

Zoning By-Law

3. *The Application for Site Plan Approval lists the date the plans were prepared as 7/30/15, however the plans show that they were prepared on August 12, 2015. This is likely a minor typo. We defer to the Planning Board if the application should be corrected. (§1.3.3.3.a)*
   No further comment necessary.

4. *Some of the plan sheets (Sheets 3, 4 and 8) were prepared at a scale of 1" = 60' instead of 1" = 40'. The plans were legible and we were able to read them. We defer to the Planning Board if the scale of 1" = 60' is acceptable to the Board. (§1.3.3.3.d)*
   The applicant is requesting a waiver from this requirement. We understand that the Planning Board will address waiver requests.

Grafton's Regulations Governing Stormwater Management

Comments pertaining to Grafton's Regulations Governing Stormwater Management were previously addressed.

Hydrology Review & MADEP Stormwater Management

13. *GEI reviewed the hydrology computations and found them to be in order except as noted below.*

    October 21, 2015:
    GEI has no further comment.
    The revised hydrology computations are in order.

14. *In the pre-development conditions the western hydrology analysis point consists of a property line approximately 300 feet long with distributed stormwater runoff. In the post-development conditions the same analysis point will have some distributed runoff from Subcatchment 1A, but there will predominantly be a concentrated flow that will be discharged from Detention Basin 1 to the remaining northwest section of the subject property where a dwelling and accessory buildings are located. The plans show an existing swale on the northwest section of the property that directs stormwater around the accessory buildings. Furthermore, GEI is aware of drainage concerns at the northwest section of the site via a complaint made in the mid-2000's. In short, we're concerned about whether the concentrated flow will negatively impact the northwest section of the property and whether the property owner finds the proposed discharge point acceptable. The Board may wish to inquire of the applicant if the property owner has authorized the proposed discharge point. Absent confirmation by the owner of the proposed discharge point, the hydrology computations should evaluate the pre- versus post-development peak runoff rates at the area up-gradient of the remaining 207 Providence Road site independently from the abutting land of Shields.*

    October 21, 2015:
    The stormwater management system has been adjusted to reduce the rate of runoff at this analysis point. Also the level spreader at Detention Basin 1 was extended to re-establish distributed flow at this location. Based upon my discussion with the design engineer on October 15, modifications to the existing drainage swale at the northwest section of the property (near the Kell home and sheds) will be considered and incorporated

into the plans. We understand that those revisions are forthcoming. Finally, confirmation from the property owner authorizing this discharge point was not provided but the design engineer responded that the applicant is committed to working with the property owner. We defer to the Planning Board if the applicant needs to submit confirmation from the property owner.
Sheets 4 and 8 were revised to show that the existing swale near the accessory buildings is to be cleaned and maintained as a grassed swale, and the plans were revised to show grading for an extension of the existing swale. The upstream end of the extension will terminate at the outlet of Detention Basin 1. These plan revisions address our technical comments. Again, we defer to the Planning Board if the applicant needs to submit confirmation from the property owner.

15. *If the proposed discharge location discussed in the preceding comment is to be utilized, then the design engineer needs to evaluate the flow path between the discharge point of Detention Basin 1 and Providence Road to determine if there is adequate hydraulic capacity and that the concentrated flow will not cause erosion along the flow path – part of the flow path consists of sparsely-vegetated soil. Likewise, the analysis should evaluate impacts to the Providence Road drainage system due to the rerouting of stormwater runoff.*

    October 21, 2015:
    Based upon my discussion with the design engineer on October 15, modifications to the existing drainage swale at the northwest section of the property (near the Kell home and sheds) will be considered and incorporated into the plans. We understand that those revisions are forthcoming.
    Acknowledged. The revised hydrology computations show significant decreases in the peak rates of runoff at Analysis Pont AP-1. Sheets 4 and 8 were revised to show that the existing swale near the accessory buildings is to be cleaned and maintained as a grassed swale, and the plans were revised to show grading for an extension of the existing swale. The upstream end of the extension will terminate at the outlet of Detention Basin 1.

16. *GEI has no issues relative to compliance with the MADEP Stormwater Management Standards except as noted below.*

    October 21, 2015:
    GEI has no further comment.
    Compliance with MADEP Stormwater Management Standards is reasonable.

20. *Riprap sizing calculations (e.g. stone size and apron dimensions) must be provided to demonstrate that the riprap aprons at the pipe outlets were adequately sized.*

    October 21, 2015:
    Riprap sizing calculations were not provided.
    Acknowledged. Calculations were provided and are in order. The lengths of the proposed aprons exceed the minimum apron lengths calculated.

23. *No information was submitted concerning soil testing at the two stormwater basins and based upon visual observations during our site visit soil testing has not yet been performed. The basins are proposed with earth cuts of three to ten feet and one to seven feet at Detention Basins 1 and 2, respectively. We are concerned about the depths of*

bedrock and groundwater at the basins. Prolonged interception of groundwater within the detention basins could result in prolonged discharges at the basins' discharge points. Although the stormwater basins are proposed as detention basins and not as infiltration basins, soil testing should be performed to confirm design assumptions relative to the depth to bedrock and groundwater.

October 21, 2015:
Soil testing was performed by the design engineer and witnessed by GEI on October 15, 2015. We under that minor modifications to the stormwater basins may be forthcoming.
Acknowledged. The basins were revised to include a slight depression.

General Engineering

29. *The plans need to include a construction detail for the level spreader proposed at Detention Basin 1.*

October 21, 2015:
This comment was not addressed.
Acknowledged. Sheet 13 was revised to include a construction detail.

32. *The drain manholes are fairly shallow but nevertheless ladder rungs should be included on the "Typical Drain Manhole" construction detail on Sheet 12.*

October 21, 2015:
This comment was not addressed. The applicant responded that based on the manhole's configuration, a maintenance person would bring a ladder to enter the manhole if maintenance was required. Permanently-installed ladder rungs are typically provided in manholes and are less obstructive to maintenance operations.
Acknowledged. The construction detail was revised to include ladder rungs.

General Comments

33. *On Sheet 5, there is a leader note for a drain manhole southeast of Detention Basin 1 that appears to apply to an earlier draft of the plans – the inlet pipe diameter of 12" is incorrect and the leader does not point to a manhole.*

October 21, 2015:
This comment was not addressed. The leader note is still on Sheet 5 and does not point to any manhole.
Acknowledged. Sheet 5 was revised.

35. *It would be helpful if pertinent dimensions (e.g. turnout at the electrical equipment pads, cul-de-sac diameter) of the driveway/access road were provided on Sheet 4 of the plans.*

October 21, 2015:
Sheet 4 has not been revised to address this comment.
Acknowledged. Sheet 4 was revised.

Additional Comments, October 21, 2015

37. *On the Post Development Watershed Plan (located in the Stormwater Management System Report Addendum 1) the T_c for subcatchment 2A is listed as 6.0 minutes. However the T_c used in the hydrology calculations for this subcatchment was 12.0 minutes. The plan should be revised to reflect what was modeled in the Stormwater Management System Report Addendum 1.*
Acknowledged. The Post Development Watershed Plan was revised.

38. *Sheet 5 of the plan set shows a 12-inch outlet pipe exiting Detention Basin 1. However in the Stormwater Management System Report Addendum 1, a 15-inch outlet pipe was modeled at this location. The information must be consistent.*
Acknowledged. Sheet 5 was revised.

39. *The length of Detention Basin 2's outlet pipe, as measured off of the plans, does not match the length used for this hydrology calculations in the Stormwater Management System Report Addendum 1. The plans and the hydrology calculations need to be consistent.*
Acknowledged. The plans and calculations were revised and are consistent.

40. *Sheet 5 does not indicate the size or type of pipe to be installed at Detention Basin 2's outlet. Sheet 5 should indicate the size and type of pipe to be installed at this location and the plans should be consistent with the Stormwater Management System Report Addendum 1.*
Acknowledged. The plans and calculations were revised.

41. *Sheet 5 does not indicate the pipe invert elevations for the inlet and outlet of the discharge pipe exiting Detention Basin 2. Sheet 5 should indicate the size and type of pipe to be installed at this location and the plans should be consistent with the Stormwater Management System Report Addendum 1.*
Acknowledged. The plans and calculations were revised.

We trust this letter addresses your review requirements. Feel free to contact this office if you have any questions or comments.

Very truly yours,
Graves Engineering, Inc.

Jeffrey M. Walsh, P.E.
Vice President

cc: Grafton Conservation Commission
Richard R. Riccio III, P.E.; Field Engineering Co., Inc.